ZZZ PCB@

PCB GH53G LA-L191P LS-L031P/K852P/K853P
DAZ30A00101

ZZZ LOGO@

ROYALTY HDMI W/LOGO+HDCP
RO0000003HM

ZZZ X4E@

SMT EMC EG0 G1 G1R FOR EE AL191 GH53G
X4EAR4BOL01

ZZZ1 X4EFP@

SMT EMC EG0 G1 G1R FOR EE AL191 GH53G
X4EAR4BOL21

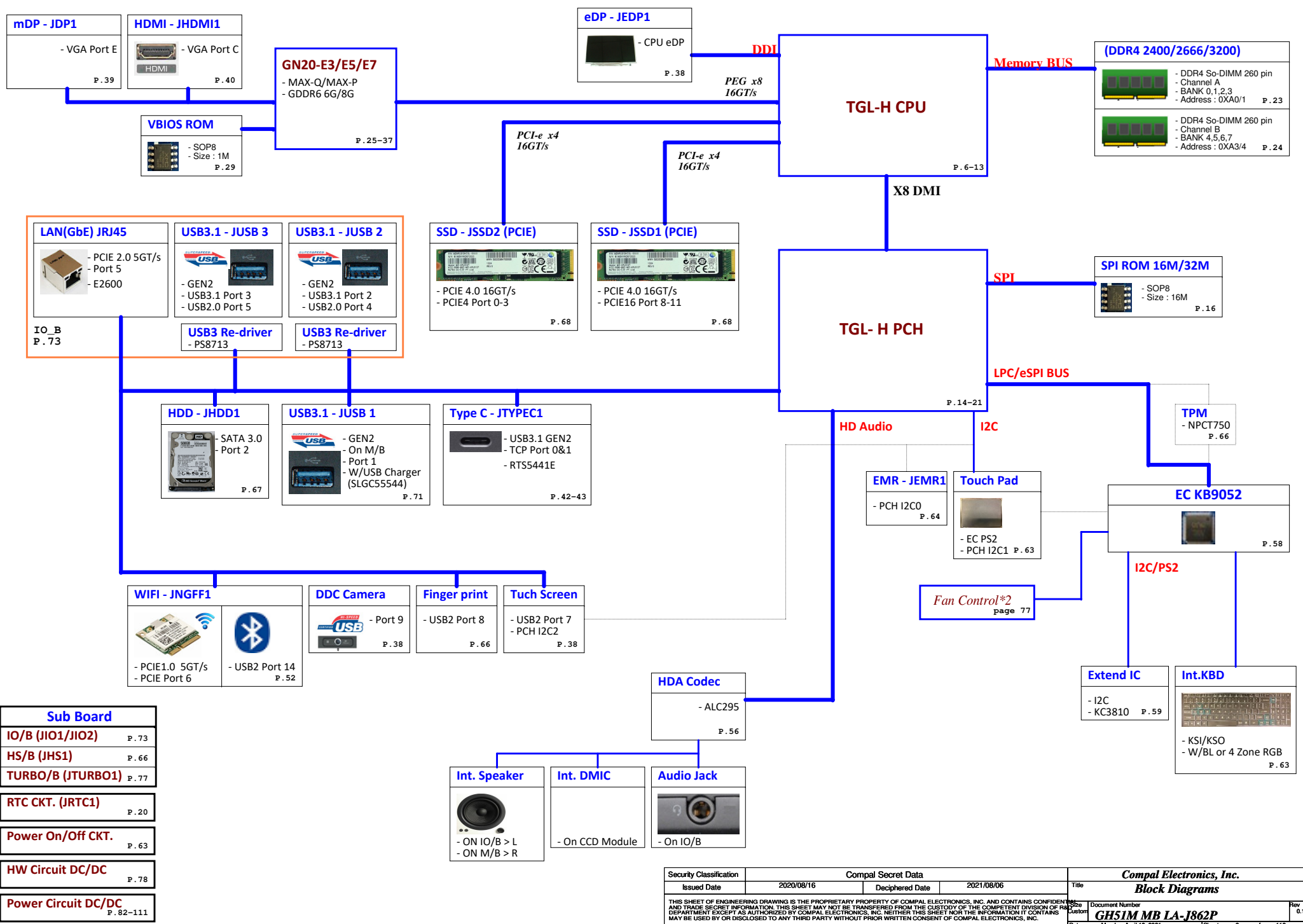# Compal Confidential

MB Schematic Document

GH51G/GH53G/GH57G/GH71G/GH73G

LA-L191P

Rev:1.A

2020.04.12

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Title: *Cover Sheet*

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HDMI - JHDMI1
- VGA Port C
HDMI
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- GDDR6 6G/8G
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- SOP8
- Size : 1M
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- CPU eDP
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DDI

PEG x8 16GT/s

TGL-H CPU
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(DDR4 2400/2666/3200)
- DDR4 So-DIMM 260 pin
- Channel A
- BANK 0,1,2,3
- Address : 0XA0/1   P.23
- DDR4 So-DIMM 260 pin
- Channel B
- BANK 4,5,6,7
- Address : 0XA3/4   P.24

X8 DMI

PCI-e x4 16GT/s

PCI-e x4 16GT/s

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- PCIE 2.0 5GT/s
- Port 5
- E2600

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USB3.1 - JUSB 3
- GEN2
- USB3.1 Port 3
- USB2.0 Port 5

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- GEN2
- USB3.1 Port 2
- USB2.0 Port 4

USB3 Re-driver
- PS8713

USB3 Re-driver
- PS8713

SSD - JSSD2 (PCIE)
- PCIE 4.0 16GT/s
- PCIE4 Port 0-3
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SSD - JSSD1 (PCIE)
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SPI ROM 16M/32M
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- Size : 16M
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HD Audio

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I2C/PS2

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DDC Camera
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Finger print
- USB2 Port 8
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Tuch Screen
- USB2 Port 7
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Extend IC
- I2C
- KC3810   P.59

Int.KBD
- KSI/KSO
- W/BL or 4 Zone RGB
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HDA Codec
- ALC295
P.56

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HS/B (JHS1)	P.66
TURBO/B (JTURBO1)	P.77

RTC CKT. (JRTC1) P.20

Power On/Off CKT. P.63

HW Circuit DC/DC P.78

Power Circuit DC/DC P.82-111

Int. Speaker
- ON IO/B > L
- ON M/B > R

Int. DMIC
- On CCD Module

Audio Jack
- On IO/B

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EC Board ID Table for AD channel

Vcc	3.3V +/- 5%	
Ra	100K +/- 1%	

Board ID	Rb	Vmin	Vtyp	Vmax	EC AD	
0	0		0.000 V	0.300 V	0x00 – 0x13	
1	12K +/- 1%	0.347 V	0.345 V	0.360 V	0x14 – 0x1E	SD034120280
2	15K +/- 1%	0.423 V	0.430 V	0.438 V	0x1F – 0x25	SD034150280
3	20K +/- 1%	0.541 V	0.550 V	0.559 V	0x26 – 0x30	SD034200280
4	27K +/- 1%	0.691 V	0.702 V	0.713 V	0x31 – 0x3A	SD034270280
5	33K +/- 1%	0.807 V	0.819 V	0.831 V	0x3B – 0x45	SD034330280
6	43K +/- 1%	0.978 V	0.992 V	1.006 V	0x46 – 0x54	SD034430280
7	56K +/- 1%	1.169 V	1.185 V	1.200 V	0x55 – 0x64	SD034560280
8	75K +/- 1%	1.398 V	1.414 V	1.430 V	0x65 – 0x76	SD034750280
* 9	100K +/- 1%	1.634 V	1.650 V	1.667 V	0x77 – 0x87	SD034100380
10	130K +/- 1%	1.849 V	1.865 V	1.881 V	0x88 – 0x96	SD034130380
11	160K +/- 1%	2.015 V	2.031 V	2.046 V	0x97 – 0xA4	SD034160380
12	200K +/- 1%	2.185 V	2.200 V	2.215 V	0xA5 – 0xAF	SD034200380
* 13	240K +/- 1%	2.316 V	2.329 V	2.343 V	0xB0 – 0xB7	SD000001B80
14	270K +/- 1%	2.395 V	2.408 V	2.421 V	0xB8 – 0xBF	SD000000G280
15	330K +/- 1%	2.521 V	2.533 V	2.544 V	0xC0 – 0xC9	SD034330380
16	430K +/- 1%	2.667 V	2.677 V	2.687 V	0xCA – 0xD4	SD00000WM80
17	560K +/- 1%	2.791 V	2.800 V	2.808 V	0xD5 – 0xDD	SD034560380
18	750K +/- 1%	2.905 V	2.912 V	2.919 V	0xDE – 0xF0	SD00000AL80
19	NC	3.000 V	3.000 V		0xF1 – 0xFF	

Board ID	PCB Revision
0	50 Rev0.1
1	50 Rev0.2
2	50 Rev1.0
3	
4	50 Rev0.1+RGB
5	50 Rev0.2+RGB
6	50 Rev1.0+RGB
7	
8	60 Rev0.1
9	60 Rev0.2/1.0/1A
10	
11	
12	60 Rev0.1+RGB
13	60 Rev0.2/1.0/1A+RGB
14	
15	
16	
17	
18	
19	

For PreMP BOM 4/12
keep EVT2 setting
ID:9 (100K)
ID:13(240K)

*PCB Version
*Key board type

BUS / Device table

BUS	Device	Address(7 bit)	Address(8bit) Write	Address(8bit) Read
I2C_1 (+3V_PRIM)	TM-P3393-003 (Touch Pad)			
I2C_5 (+3VS)	(Touch Screen)			
PCH_SMBCLK (+3VS)	DIMM1			
	DIMM2			
PCH_SML0CLK (+1.8VALW)	BURNSIDE-BRIDGE 1	0x53		
	BURNSIDE-BRIDGE 2	0x54		
PCH_SML1CLK (+1.8VALW)	PD PTPS65991	0x21		
	(EC)			
EC_SMB_CK0 (+3VLP)	BQ24780 (Charger IC)	0x12		
	BATTERY PACK	0x16		
EC_SMB_CK1 (+3VLP_EC)	GN20 E3/E5/E7 (VGA)	0x9E		
	Thermal Sensor (NCT7718W)	1001_100xb	1001_1001b	1001_1000b
	Thermal Sensor (G781)	1001_1010b	1001_1010b	1001_1010b
	(PCH)			
EC_SMB_CK2 (+5VS)	LED driver	0xC0		
	(PER KEY)			
	KC3810	0xC0		

SIGNAL / STATE table

STATE \ SIGNAL	SLP_S3#	SLP_S4#	SLP_S5#	+VALW	+V	+VS
S0 (Full ON)	HIGH	HIGH	HIGH	ON	ON	ON
S3 (Suspend to RAM)	LOW	HIGH	HIGH	ON	ON	OFF
S4 (Suspend to Disk)	LOW	LOW	HIGH	ON	OFF	OFF
S5 (Soft OFF)	LOW	LOW	LOW	ON	OFF	OFF

Power Plane	Description	S0	S3	S4	S5
+RTCVCC	RTC Battery Power	ON	ON	ON	ON
+19V_VIN	Adapter power supply	N/A	N/A	N/A	N/A
+12.6V_BATT	Battery power supply	N/A	N/A	N/A	N/A
+19VB	AC or battery power rail for power circuit.	N/A	N/A	N/A	N/A
+3VLP	+19VB to +3VLP power rail for suspend power	ON	ON	ON	ON
+5VALW	+5V Always power rail	ON	ON	ON	ON
+3VALW	System +3VALW always on power rail	ON	ON	ON	ON*
+3VALW_DSW	+3VALW power for PCH DSW rails	ON	ON	ON	ON
+1.05VALW	+1.05V Always power rail	ON	ON	ON	ON*
+1.2V_VDDQ	DDR4 +1.2V power rail	ON	ON	OFF	OFF
+1.05V_VCCST	Sustain voltage for processor in Standby modes	ON	ON	OFF	OFF
+5VS	System +5V power rail	ON	OFF	OFF	OFF
+3VS	System +3V power rail	ON	OFF	OFF	OFF
+1.05VS_VCCSTG	+1.05VALW_PRIM Gated version of VCCST	ON	OFF	OFF	OFF
+0.6VS_VTT	DDR +0.6VS power rail for DDR terminator .	ON	OFF	OFF	OFF
+VCC_CORE	Core voltage for CPU	ON	OFF	OFF	OFF
+VCC_GT	Sliced graphics power rail	ON	OFF	OFF	OFF
+VCCIO	CPU IO +0.95VS power rail	ON	OFF	OFF	OFF
+VCC_SA	System Agent power rail	ON	OFF	OFF	OFF
+1.8VSDGPU_AON	+1.8VS power rail for GPU(AON rails)	ON	OFF	OFF	OFF
+1.8VSDGPU_MAIN	+1.8VS power rail for GPU GC6	ON	OFF	OFF	OFF
+NVVDD1	Core voltage for VGA (merge core & core_s)	ON	OFF	OFF	OFF
+1.35VSDGPU	+1.35VS power rail for GPU	ON	OFF	OFF	OFF
+1.0VSDGPU	+1.0VS power rail for GPU	ON	OFF	OFF	OFF
+1.8VALW	System +1.8VALW always on power rail	ON	ON	ON	ON*

Note : ON* means that this power plane is ON only with AC power available, otherwise it is OFF.

Item (X43) / BOM Structure

Item (X43)	BOM Structure	Item (X43)	BOM Structure
Unpop	@	eDP-TS USB	TS_USB@
Connector	CONN@	eDP-TS I2C	TS_I2C@
PCB	PCB@	USB C circuit	TypeC@
UMA Only(Reserved)	UMA@	mDP	DP@
		For Acer IOAC	IOAC@
Board ID	EVT@	No Acer IOAC	NIOAC@
Board ID RGB	EVTRGB@	Intel CNVi	CNVI@
CML i5 CPU QWCC	QWCC@		
CML i7 CPU QWCB	QWCB@	FOR UART debug	UART@
TGL PCH	HM570@	Extend GPIO	KC3810@
dGPU circuit	VGA@	Finger Print	FP@
GPU_GN20_E3	E3_PS@	KB backlight	KBLED@
GPU_GN20_E5	E5_PS@	KB LED driver	LED14P@
GPU_GN20_E7	E7_PS@	CMC signal	CMC@
		Thermal sensor	TMS@
Intel request reserve	Glitch@	TPM pop	TPM@
Intel request reserve	@Glitch@		
INTEL ES sample issue	ES@	OVRM pop	OVRM@
		OVRM GEN1 pop	GEN1@
1 SPI device	1LD@	UPI OVRM GEN1 pop	UPI_GEN1@
1 SPI device	2LD@	OVRM GEN2 pop	GEN2@
32 MB Rom part	32MB@	ON OVRM GEN2 pop	ON_GEN2@
16 MB Rom part	16MB@	UPI OVRM GEN2 pop	UPI_GEN2@
		12VFAN POWER	12VFAN@
PREM POWER RAIL	PREM@	5VFAN POWER	5VFAN@
VOL POWER RAIL	VOL@		
PERKEY CIRCIUT	PERKEY@	HDMI ROYALTY	LOGO@

43 Level

43 Level	Description	BOM Structure
431AR4BOL01	SMT MB AL191 GH51G GN20 E3 6G CC BRL	VGA@/TypeC@/TS_USB@/TPM@/TMS@/RF@/PREM@/PCB@/NPERKEY@/NKC3810@/MP@/KBLED@/IOAC@/Glitch@/FP@/ES@/DP@/CNVI@/CMC@/5VFAN@/2LD@/16M@/X4E@/GEN1@/OVRM@/E3_PS@/QWCC@/EVT@/X76E3_HYN@
431AR4BOL04	SMT MB AL191 GH51G GN20 E3 6G CB B3L	VGA@/TypeC@/TS_USB@/TPM@/TMS@/RF@/PREM@/PCB@/NPERKEY@/NKC3810@/MP@/KBLED@/IOAC@/Glitch@/FP@/ES@/DP@/CNVI@/CMC@/5VFAN@/2LD@/16M@/X4E@/GEN1@/OVRM@/E3_PS@/QWCB@/EVT@/X76E3_SUM@
431AR4BOL05	SMT MB AL191 GH51G GN20 E5 Q 8G CC BRL	VGA@/TypeC@/TS_USB@/TPM@/TMS@/RF@/PREM@/PCB@/NPERKEY@/NKC3810@/MP@/KBLED@/IOAC@/Glitch@/FP@/ES@/DP@/CNVI@/CMC@/5VFAN@/2LD@/16M@/X4E@/GEN1@/OVRM@/E5_PS@/QWCC@/EVT@/X76E5_HYN@
431AR4BOL08	SMT MB AL191 GH51G GN20 E5 Q 8G CB B3L	VGA@/TypeC@/TS_USB@/TPM@/TMS@/RF@/PREM@/PCB@/NPERKEY@/NKC3810@/MP@/KBLED@/IOAC@/Glitch@/FP@/ES@/DP@/CNVI@/CMC@/5VFAN@/2LD@/16M@/X4E@/GEN1@/OVRM@/E5_PS@/QWCB@/EVT@/X76E5_SUM@
431AR4BOL51	SMT MB AL191 GH73G GN20 E5 P 8G CC BRL	VGA@/TypeC@/TS_USB@/TPM@/TMS@/RF@/PREM@/PCB@/NPERKEY@/NKC3810@/MP@/KBLED@/IOAC@/Glitch@/FP@/ES@/DP@/CNVI@/CMC@/5VFAN@/2LD@/16M@/X4E@/GEN1@/OVRM@/E5_PS@/QWCC@/EVTRGB@/LED14P@/X76E5_HYN@
431AR4BOL54	SMT MB AL191 GH73G GN20 E5 P 8G CB B3L	VGA@/TypeC@/TS_USB@/TPM@/TMS@/RF@/PREM@/PCB@/NPERKEY@/NKC3810@/MP@/KBLED@/IOAC@/Glitch@/FP@/ES@/DP@/CNVI@/CMC@/5VFAN@/2LD@/16M@/X4E@/GEN1@/OVRM@/E5_PS@/QWCB@/EVTRGB@/LED14P@/X76E5_SUM@

Item (X4E)

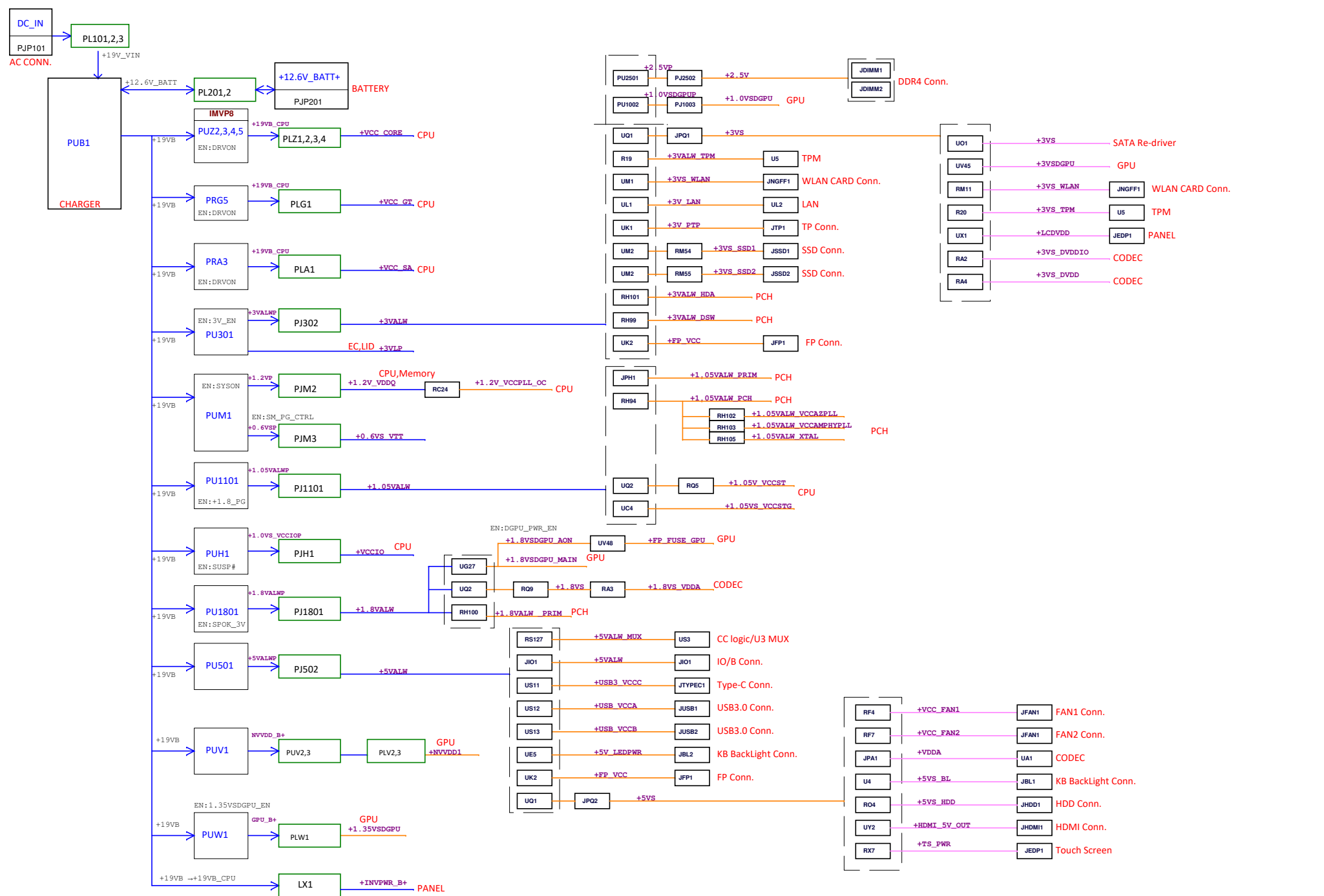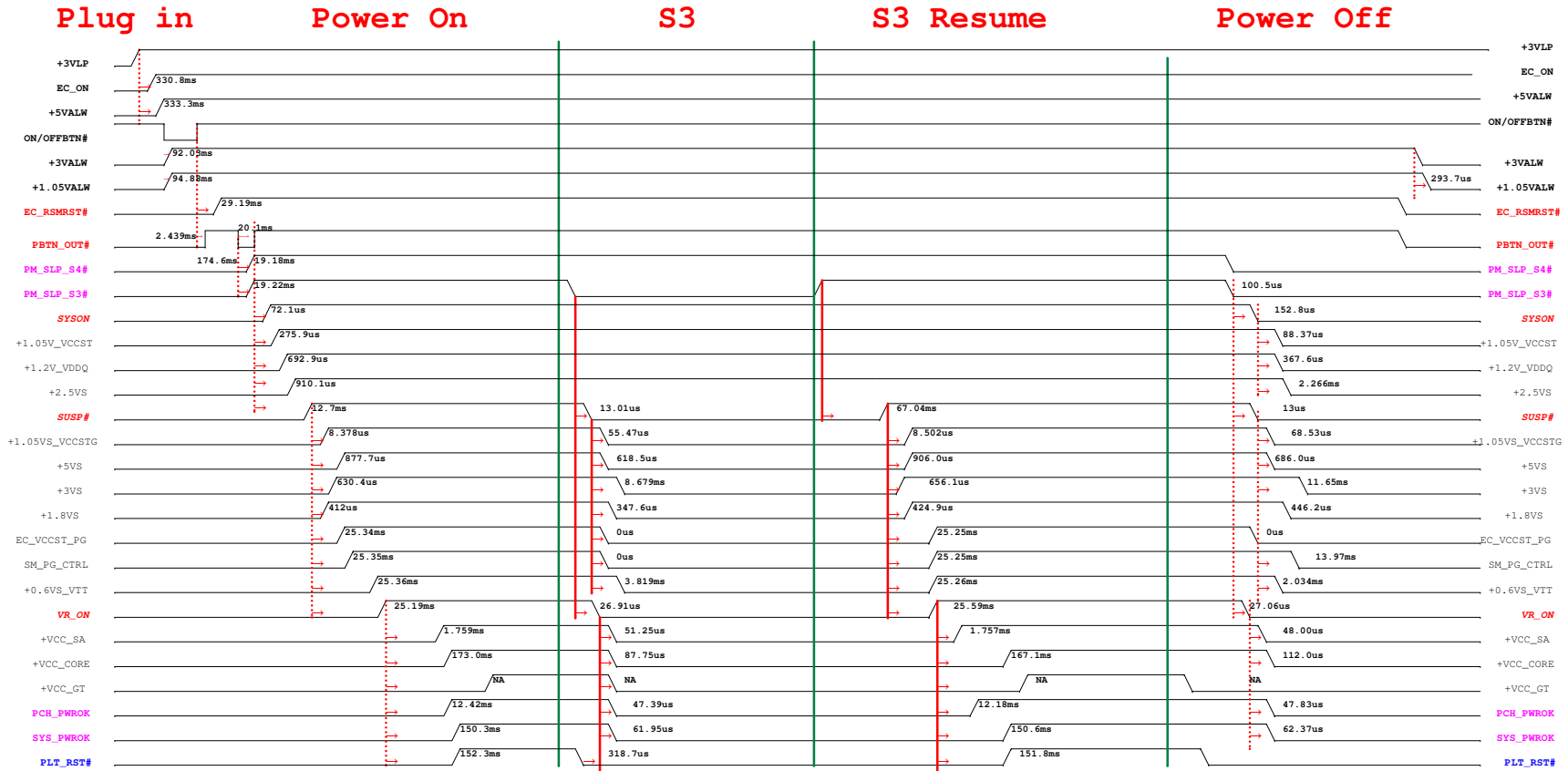| Item (X4E)	BOM Structure
EMI requirement	EMI@
EMI require reserve	XEMI@
ESD requirement	ESD@
ESD require reserve	XESD@
FP ESD requirement	FPESD@
X4EAR3BOL01	X4E@
(w/FP)	X4EFP@

435P4RBOL01(IO/B)
X4EP4RBOL01(IO/B)

Item (X76)

Item (X76)	BOM Structure
VRAM-Hynix(6G)	HYN_E3@/X76_HYN@
VRAM-SAMSUNG(6G)	SAM_E3@/X76_SAM@
VRAM-Hynix(8G)	HYN_E57@/X76_HYN@
VRAM-SAMSUNG(8G)	SAM_E57@/X76_SAM@

X76869BOLA3 - HYNIX 6G		X76E3_HYN@	E3
X76869BOLA4 - SAMSUNG 6G		X76E3_SAM@	
X76869BOLA5 - HYNIX 8G		X76E5_HYN@	E5/E7
X76869BOLA6 - SAMSUNG 8G		X76E5_SAM@	
X76869BOLA9 - ON OVRM		X76_ON@	OVRM
X76869BOLAA - uPI OVRM		X76_UPI@	

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DH5VF_EVT Power Sequence   AC mode

BIOS ver: V0.02W1
 EC: ver: V002AT04

Plug in   Power On   S3   S3 Resume   Power Off

Signal	Plug in	Power On	S3	S3 Resume	Power Off	Signal
+3VLP						+3VLP
EC_ON	330.8ms					EC_ON
+5VALW	333.3ms					+5VALW
ON/OFFBTN#						ON/OFFBTN#
+3VALW	92.09ms					+3VALW
+1.05VALW	94.88ms				293.7us	+1.05VALW
EC_RSMRST#	29.19ms					EC_RSMRST#
PBTN_OUT#	2.439ms 20.1ms					PBTN_OUT#
PM_SLP_S4#	174.6ms 19.18ms					PM_SLP_S4#
PM_SLP_S3#	19.22ms			100.5us		PM_SLP_S3#
SYSON	72.1us			152.8us		SYSON
+1.05V_VCCST	275.9us			88.37us		+1.05V_VCCST
+1.2V_VDDQ	692.9us			367.6us		+1.2V_VDDQ
+2.5VS	910.1us			2.266ms		+2.5VS
SUSP#	12.7ms	13.01us	67.04ms	13us		SUSP#
+1.05VS_VCCSTG	8.378us	55.47us	8.502us	68.53us		+1.05VS_VCCSTG
+5VS	877.7us	618.5us	906.0us	686.0us		+5VS
+3VS	630.4us	8.679ms	656.1us	11.65ms		+3VS
+1.8VS	412us	347.6us	424.9us	446.2us		+1.8VS
EC_VCCST_PG	25.34ms	0us	25.25ms	0us		EC_VCCST_PG
SM_PG_CTRL	25.35ms	0us	25.25ms	13.97ms		SM_PG_CTRL
+0.6VS_VTT	25.36ms	3.819ms	25.26ms	2.034ms		+0.6VS_VTT
VR_ON	25.19ms	26.91us	25.59ms	27.06us		VR_ON
+VCC_SA	1.759ms	51.25us	1.757ms	48.00us		+VCC_SA
+VCC_CORE	173.0ms	87.75us	167.1ms	112.0us		+VCC_CORE
+VCC_GT	NA	NA	NA	NA		+VCC_GT
PCH_PWROK	12.42ms	47.39us	12.18ms	47.83us		PCH_PWROK
SYS_PWROK	150.3ms	61.95us	150.6ms	62.37us		SYS_PWROK
PLT_RST#	152.3ms	318.7us	151.8ms			PLT_RST#

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Title
Power Sequence

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